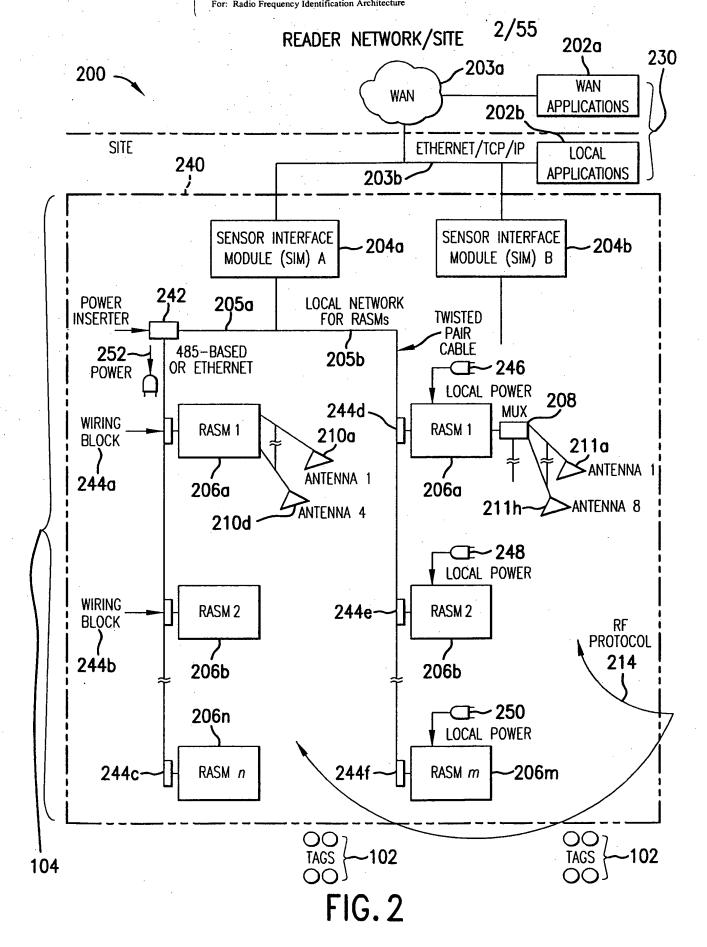
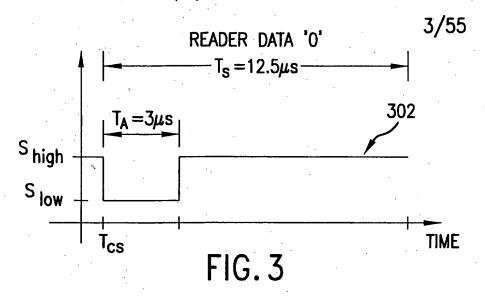
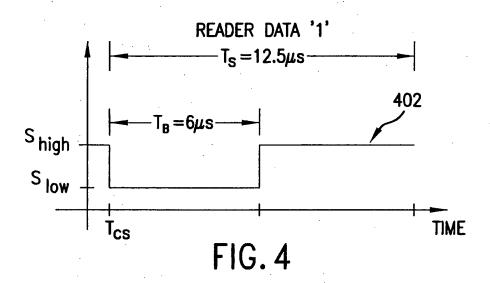


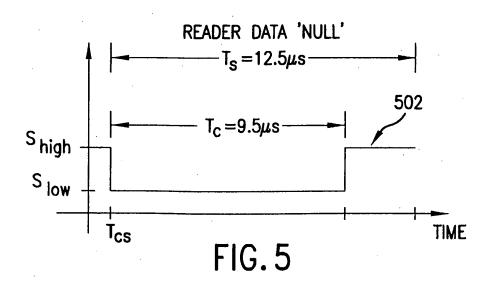
Replacement Sheet Sheet 2 of 55 Appl. No. 10/072,984; Filed: Feb 12, 2002 Dkt No. 1689.0240000; Group Unit: 2636 Inventors: SHANKS et al. Tel. No.: 202-371-2600 For: Radio Frequency Identification Architecture



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Dkt No. 1689.0240000; Group Unit: 2636
Inventors: SHANKS et al.
Tel. No.: 202-371-2600
For: Radio Frequency Identification Architecture







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For: Radio Frequency Identification Architecture

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### READER BIT '0' WITH TAG BIT '0'

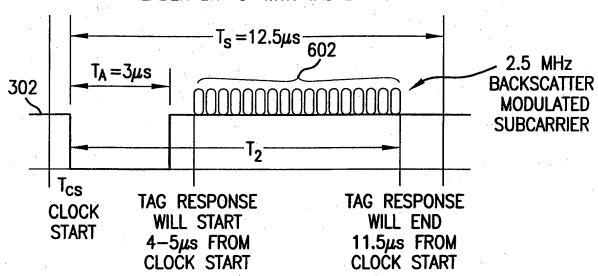


FIG. 6

#### READER BIT '1' WITH TAG BIT '0' $T_{\rm S} = 12.5 \mu {\rm s}$ 702 2.5 MHz **BACKSCATTER** 402 $T_B = 6\mu s$ **MODULATED SUBCARRIER** -T<sub>2</sub>-T<sub>CS</sub> TAG RESPONSE TAG RESPONSE **CLOCK** WILL START **WILL END START** 7-8µs FROM CLOCK START 11.5μs FROM CLOĆK START

FIG. 7

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### READER BIT 'O' WITH TAG BIT '1'

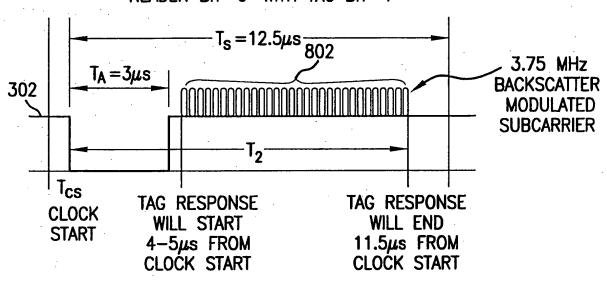


FIG.8

#### READER BIT '1' WITH TAG BIT '1'

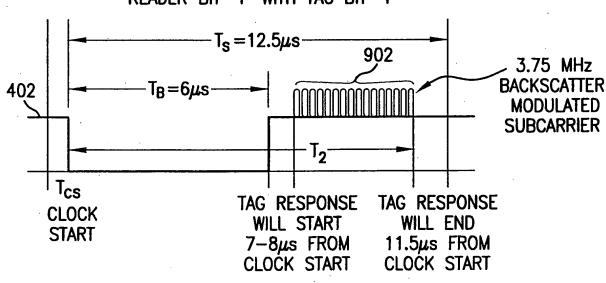


FIG.9

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Inventors: SHANKS et al Tel. No.: 202-371-2600

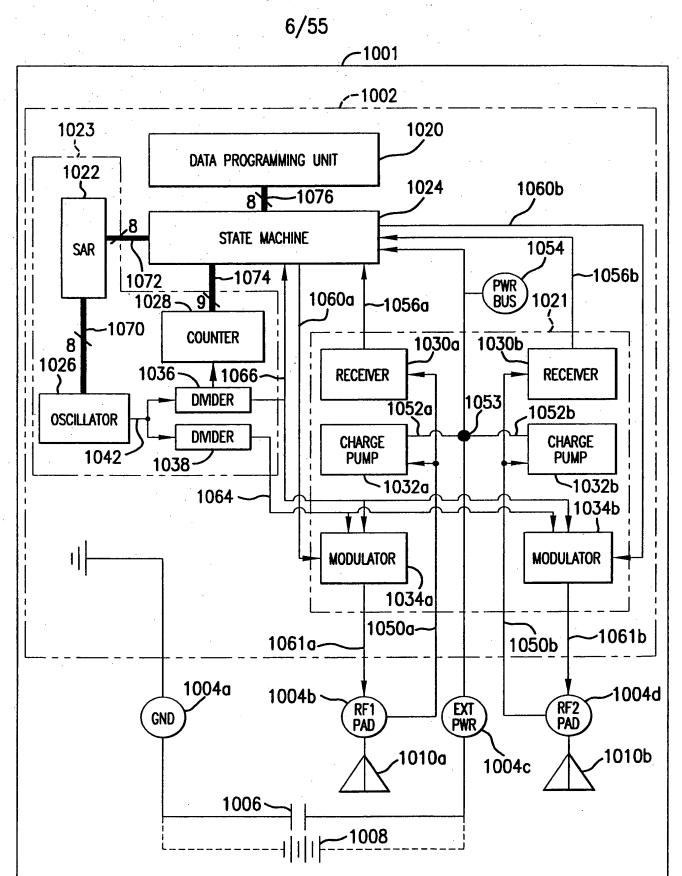


FIG. 10

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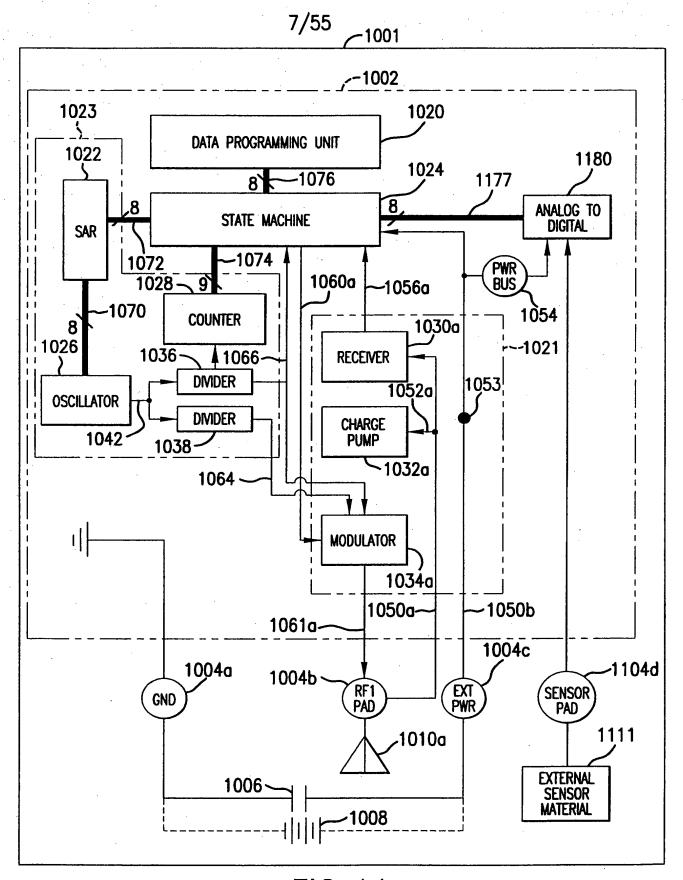
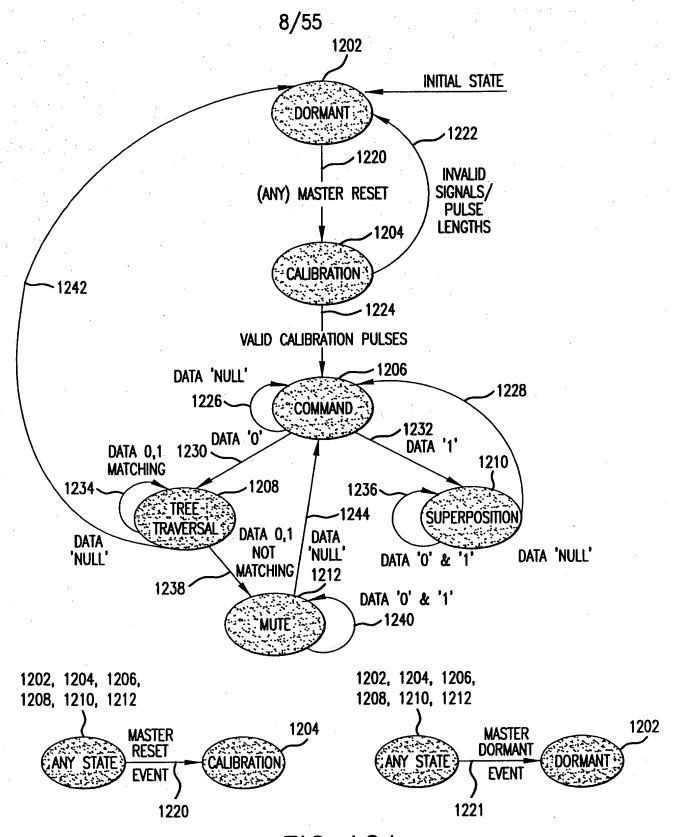


FIG. 11

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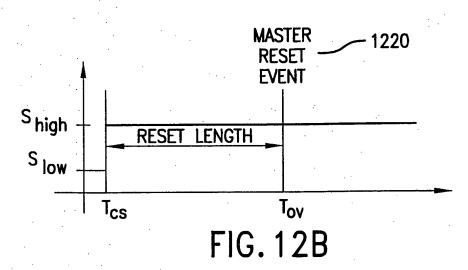
Inventors: SHANKS et al. Tel. No.: 202-371-2600

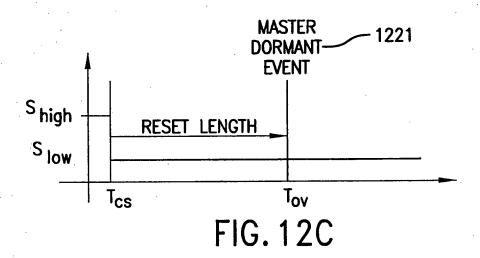


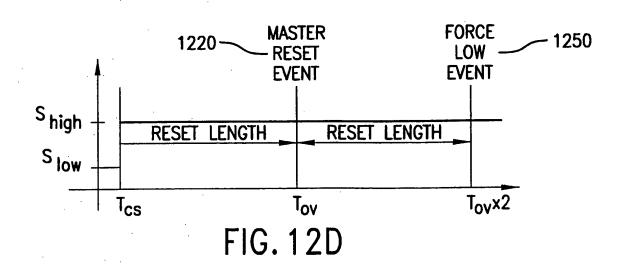
**FIG. 12A** 

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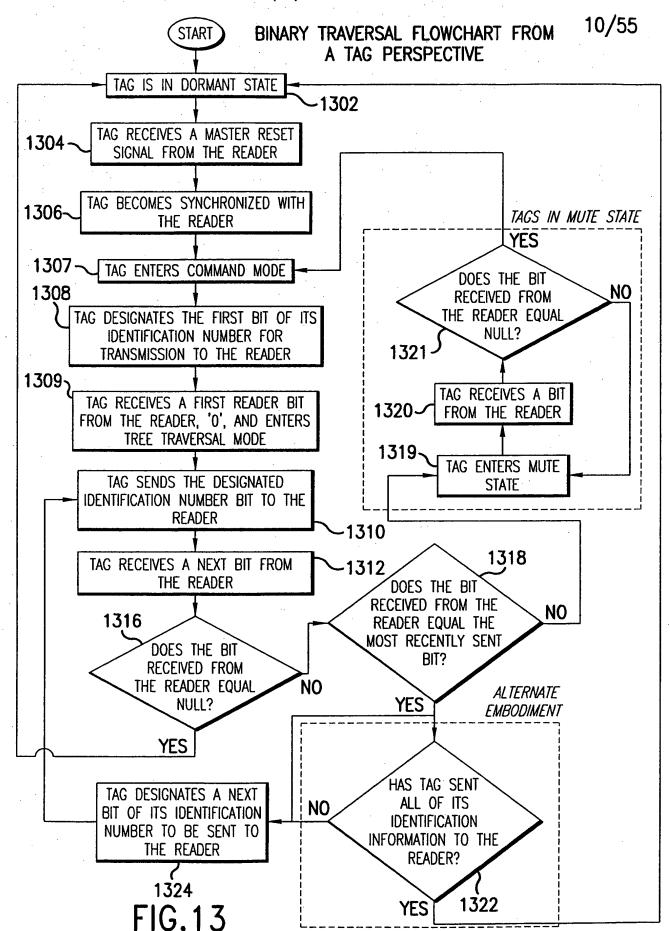
Tel. No.: 202-371-2600
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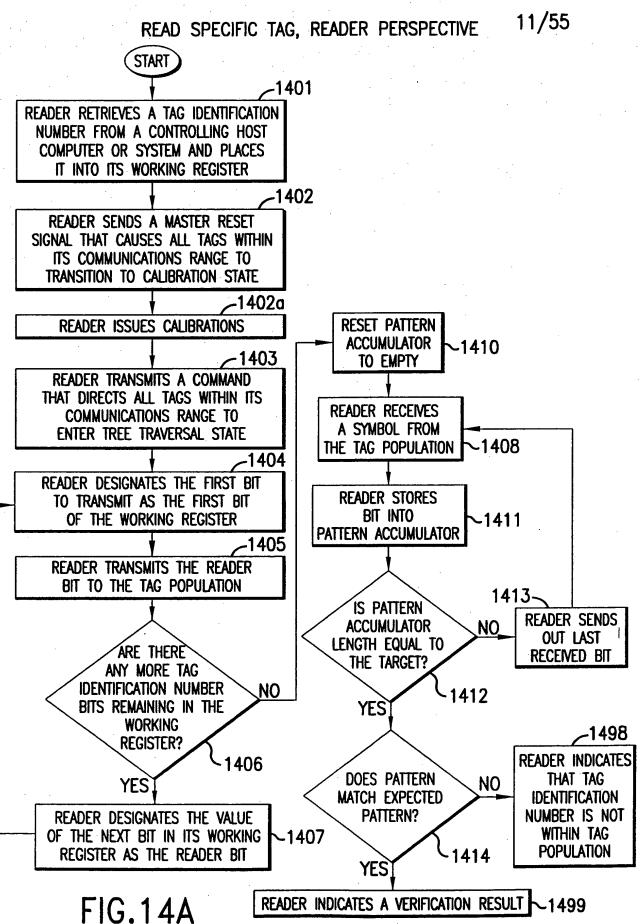


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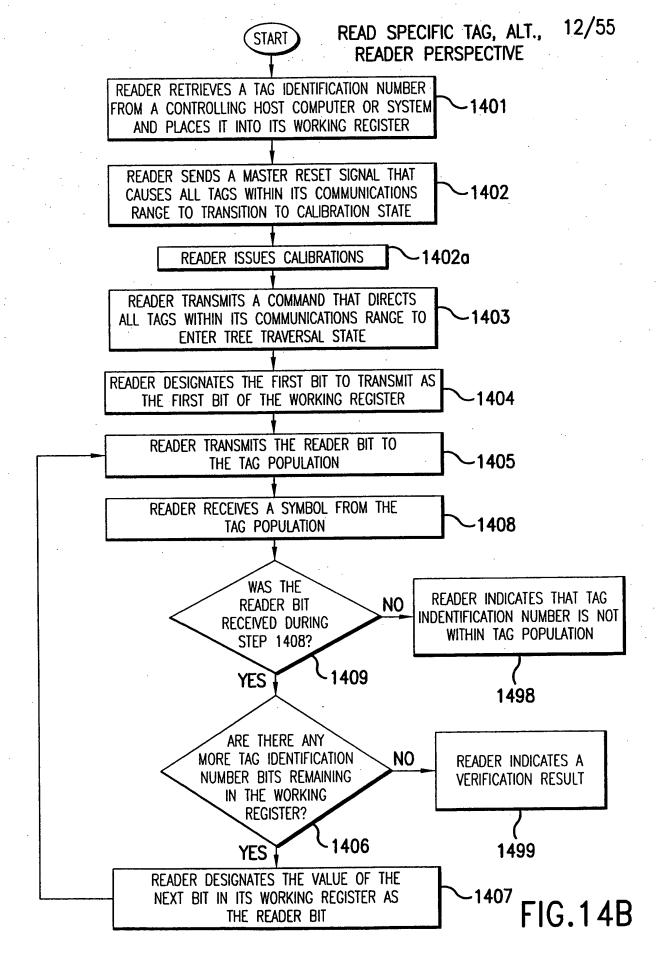


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#### READ ALL TAGS, READER PERSPECTIVES

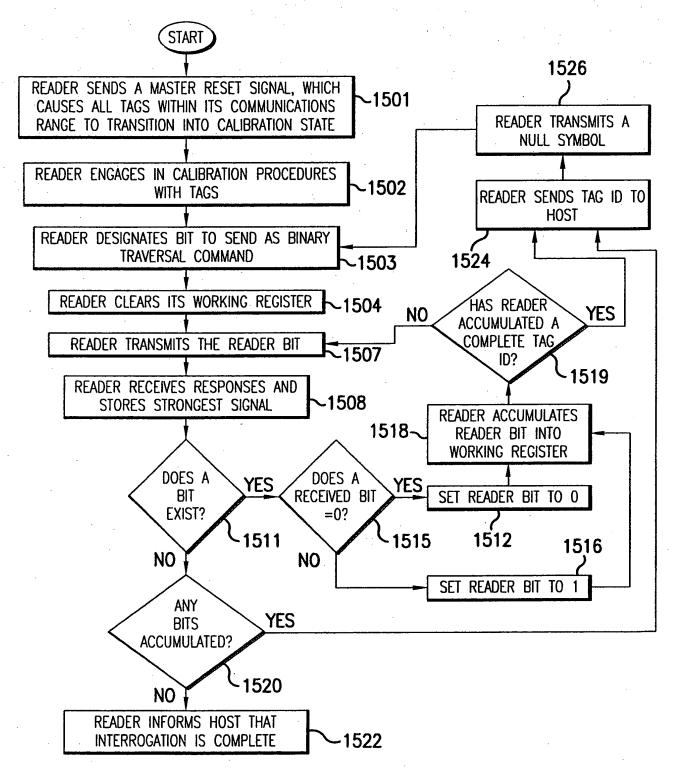
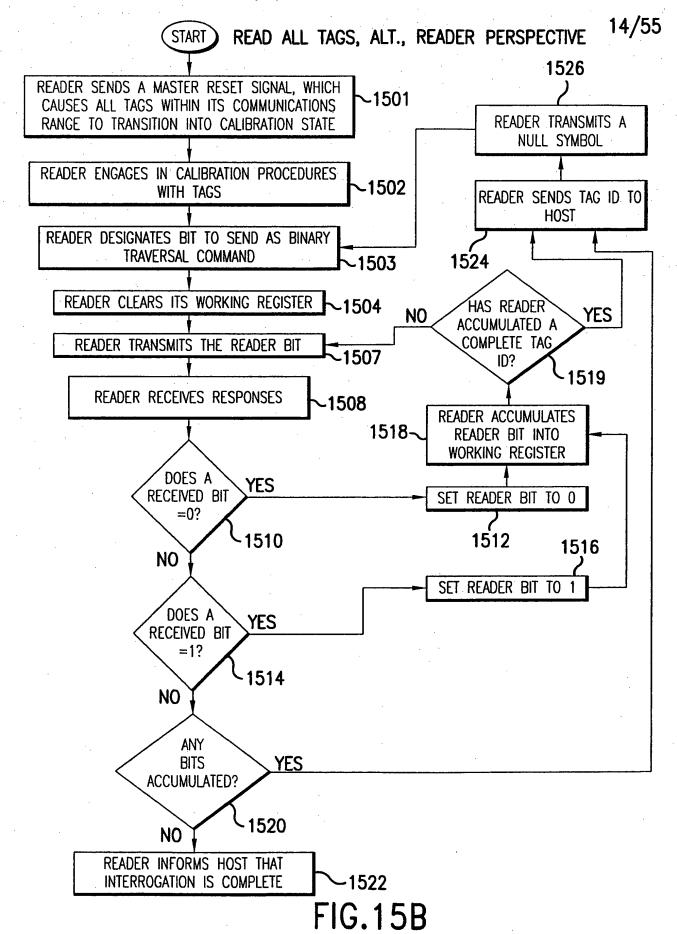


FIG.15A

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# BINARY TRAVERAL PATHS AND TREE FOR A 3-BIT TAG POPULATION

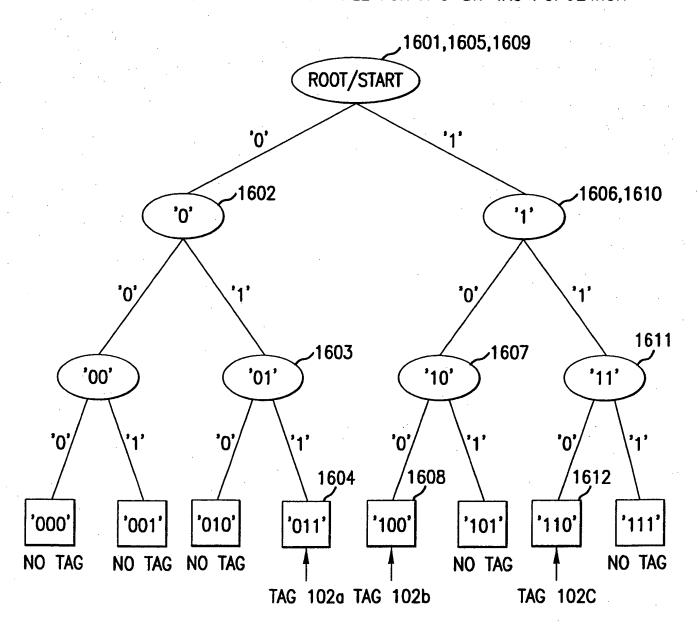


FIG. 16

Sheet 16 of 55 Appl. No. 10/072,984; Filed: Feb 12, 2002 Dkt No. 1689.0240000; Group Unit: 2636 Inventors: SHANKS et al. Tel. No.: 202-371-2600 For: Radio Frequency Identification Architecture 16/55 **START** TAG IS IN DORMANT STATE 1702 TAG RECEIVES A MASTER RESET SIGNAL FROM THE READER -1704 TAG BECOMES SYNCHRONIZED WITH -1706 THE READER TAG RECEIVES A COMMAND FROM THE READER TO ENTER SUPERPOSITION 1708 STATE TAG DESIGNATES AN INITIAL BIT OF ITS IDENTIFICATION NUMBER FOR 1710 TRANSMISSION TO THE READER TAG RECEIVES A SYMBOL FROM THE READER 1712 IS THIS YES TAG RETURNS TO SYMBOL A NULL COMMAND STATE SYMBOL? 1714 NO. 1720 DOES RECEIVED NO BIT MATCH DESIGNATED BIT? 1718 YES TAG SENDS DESIGNATED BIT -1719 TO READER TAG DESIGNATES A NEXT IDENTIFICATION FIG.17A -1722 NUMBER BIT

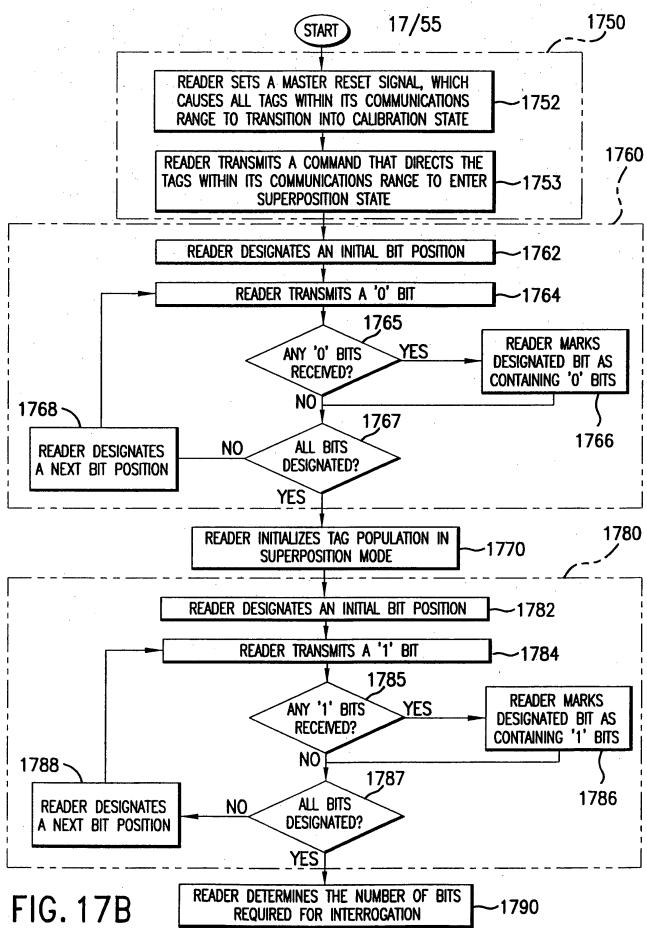
Replacement Sheet

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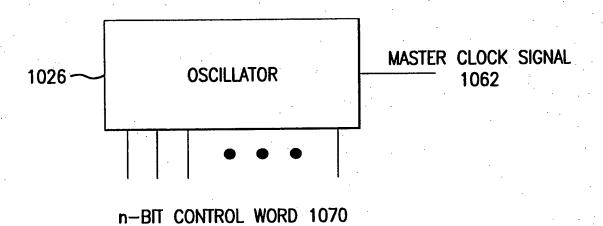


FIG. 18

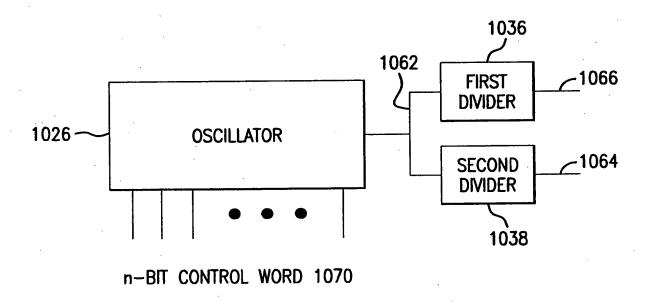


FIG. 19

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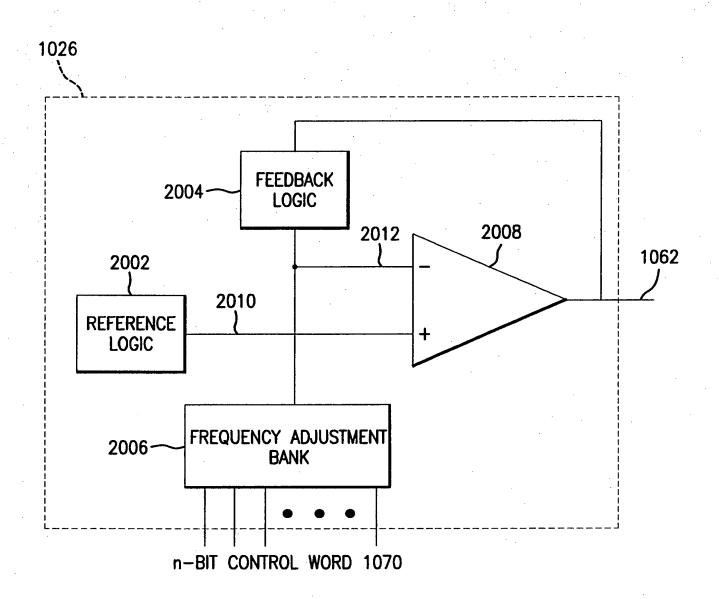


FIG. 20

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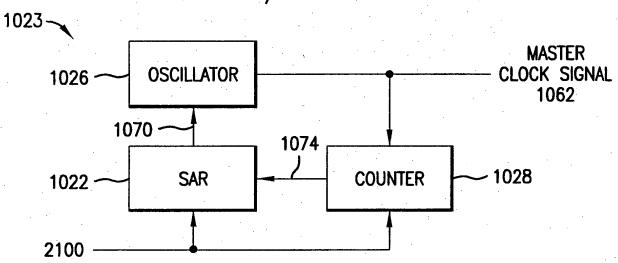
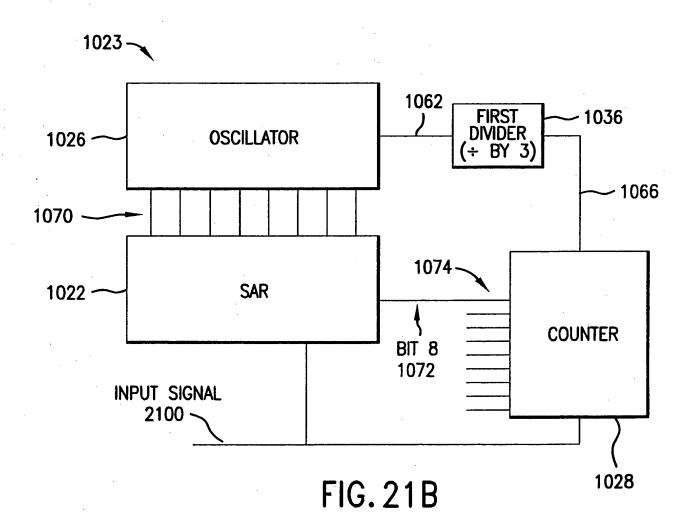
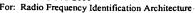
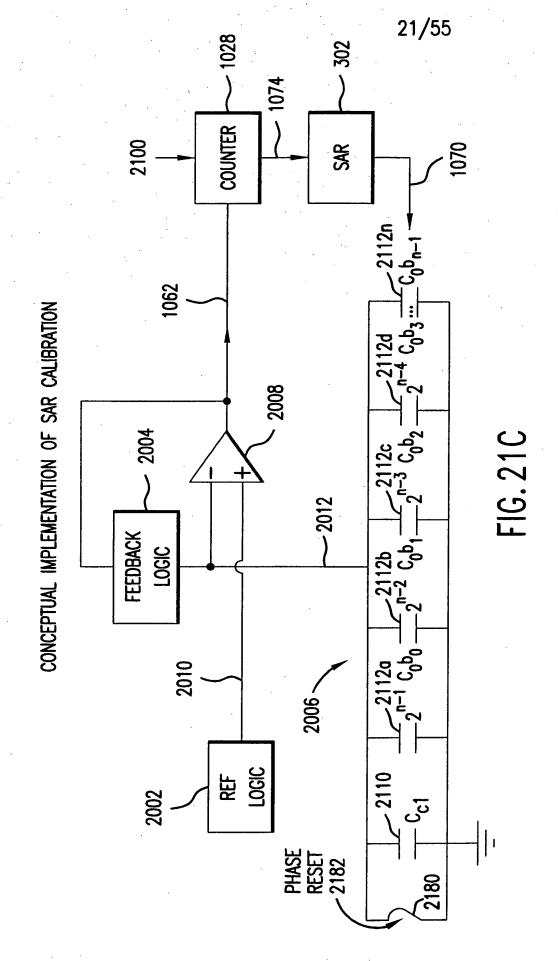


FIG. 21A



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### PHYSICAL IMPLEMENTATION OF ADJUSTABLE CAPACITOR BANK

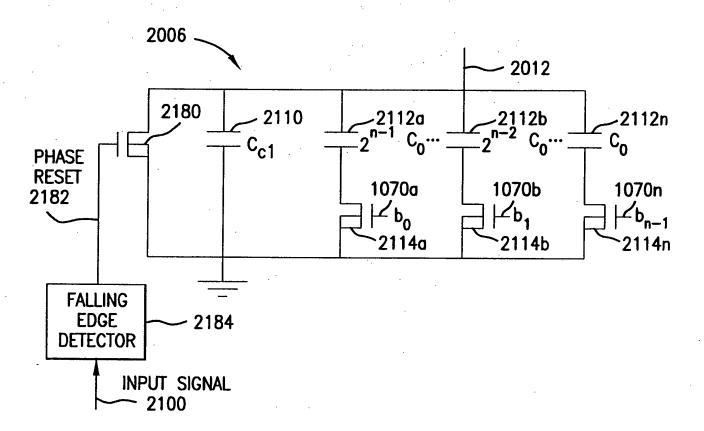
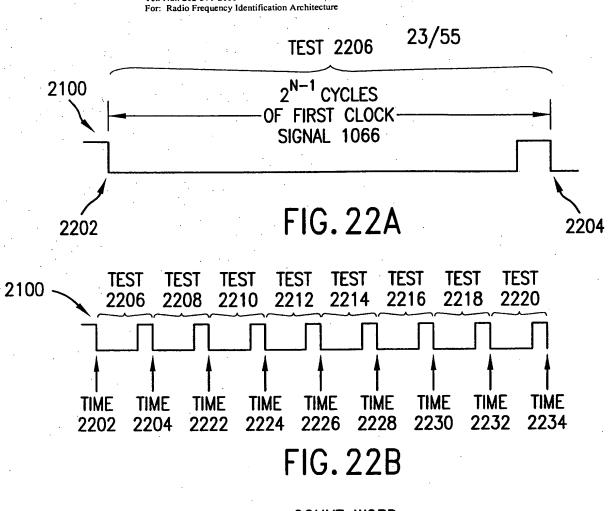


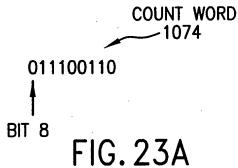
FIG. 21D

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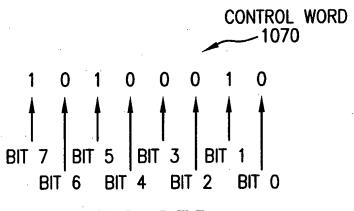
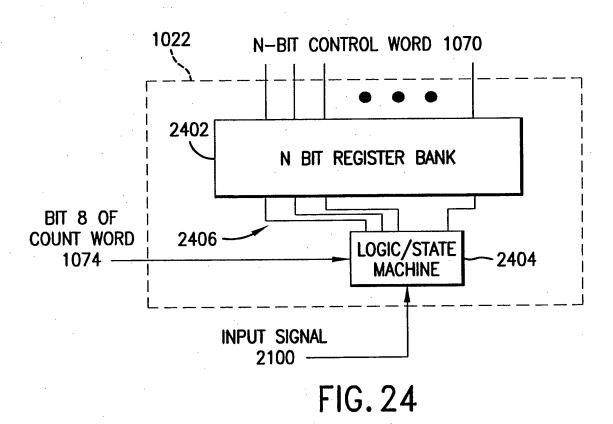


FIG. 23B

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Inventors: SHANKS et al. Tel. No.: 202-371-2600 For: Radio Frequency Identification Architecture 25/55 2500 2502 A COUNT WORD IS INCREMENTED AFTER EACH CYCLE OF THE CLOCK SIGNAL THAT OCCURS DURING A CALIBRATION CYCLE OF THE INPUT SIGNAL 2504 THE OSCILLATOR FREQUENCY IS ADJUSTED BASED UPON THE COUNT WORD AFTER COMPLETION OF STEP 2502 FIG. 25A 2502 A COUNT WORD IS INCREMENTED AFTER EACH CYCLE OF THE CLOCK SIGNAL THAT OCCURS DURING A CALIBRATION CYCLE OF THE INPUT SIGNAL 2504 THE OSCILLATOR FREQUENCY IS ADJUSTED BASED UPON THE COUNT WORD AFTER COMPLETION OF STEP 2502 2506 THE COUNT WORD IS CLEARED 2508 STEPS (a)-(c) ARE REPEATED N TIMES FOR SUBSEQUENT CORRESPONDING CYCLES OF THE INPUT SIGNAL, WHEREIN N IS EQUAL TO THE NUMBER OF BITS OF THE CONTROL WORD

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**FIG. 25B** 

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2502 A COUNT WORD IS INCREMENTED AFTER EACH CYCLE OF THE CLOCK SIGNAL THAT OCCURS DURING A CALIBRATION CYCLE OF THE INPUT SIGNAL 2504 THE OSCILLATOR FREQUENCY IS ADJUSTED BASED UPON THE COUNT WORD AFTER COMPLETION OF STEP 2502 2510 EACH CALIBRATION CYCLE OF THE INPUT SIGNAL FOLLOWED WITH A SEPARATION CYCLE ON THE INPUT SIGNAL

FIG. 25C

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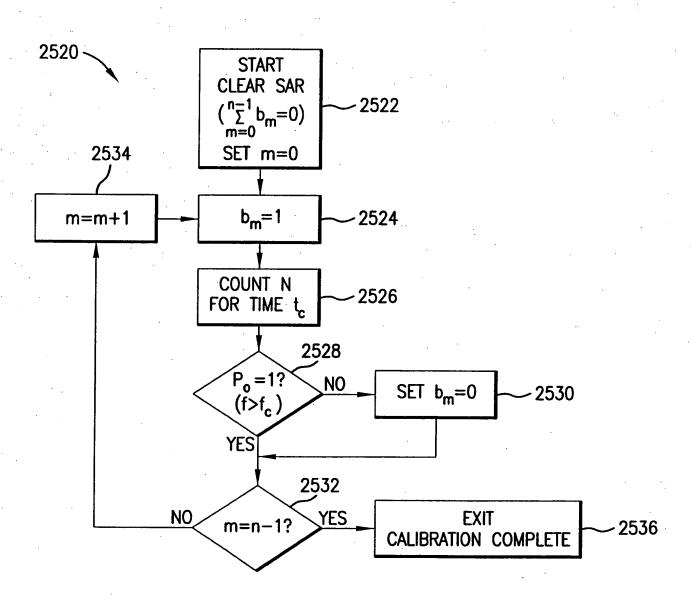


FIG. 25D

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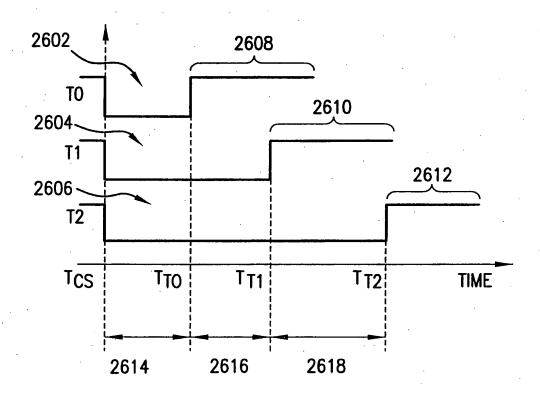
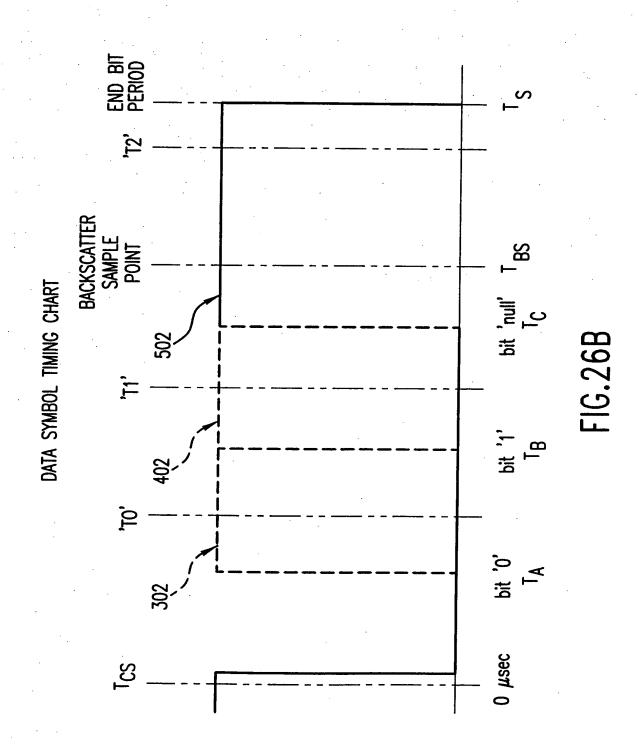


FIG.26A

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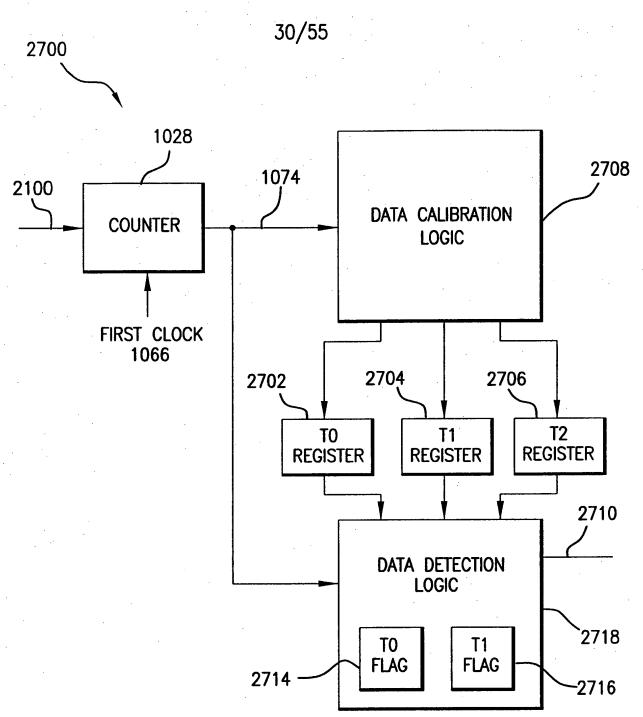
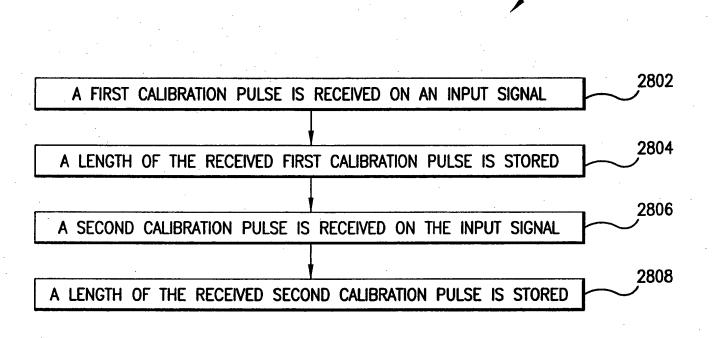


FIG.27

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FIG.28A

Tel. No.: 202-371-2600 For: Radio Frequency Identification Architecture 32/55 2800 FROM FLOWCHART 2800 2810 A DATA SYMBOL HAVING A PULSE PORTION IS RECEIVED ON THE INPUT SIGNAL, WHEREIN THE PULSE PORTION HAS A LENGTH 2812 A FIRST FLAG IS SET IF THE LENGTH OF THE PULSE PORTION IS GREATER THAN OR EQUAL TO THE STORED LENGTH OF THE FIRST CALIBRATION PULSE 2814 A SECOND FLAG IS SET IF THE LENGTH OF THE PULSE PORTION IS GREATER THAN OR EQUAL TO THE STORED LENGTH OF THE SECOND CALIBRATION PULSE 2816 THE DATA SYMBOL IS DETERMINED TO BE A FIRST LOGICAL VALUE IF THE FIRST FLAG IS NOT SET DURING STEP 2812 2818. THE DATA SYMBOL IS DETERMINED TO BE A SECOND LOGICAL VALUE IF THE FIRST FLAG IS SET AND THE SECOND FLAG IS NOT SET 2820 THE DATA SYMBOL IS DETERMINED TO BE A THIRD LOGICAL VALUE IF THE FIRST FLAG IS SET AND THE SECOND FLAG IS SET 2822 THE FIRST LOGICAL VALUE IS DEFINED AS A LOGICAL 1 BIT 2824. THE SECOND LOGICAL VALUE IS DEFINED AS A LOGICAL O BIT 2826. THE THIRD LOGICAL VALUE IS DEFINED AS A LOGICAL NULL BIT

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Inventors: SHANKS et al.

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FIG.28B

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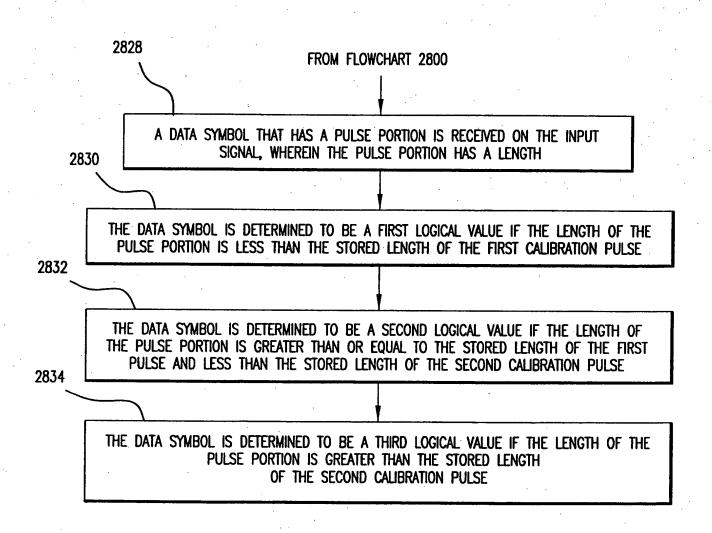


FIG.28C

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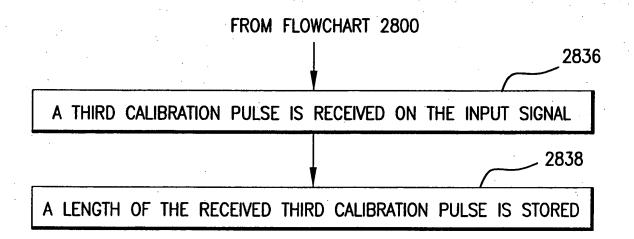
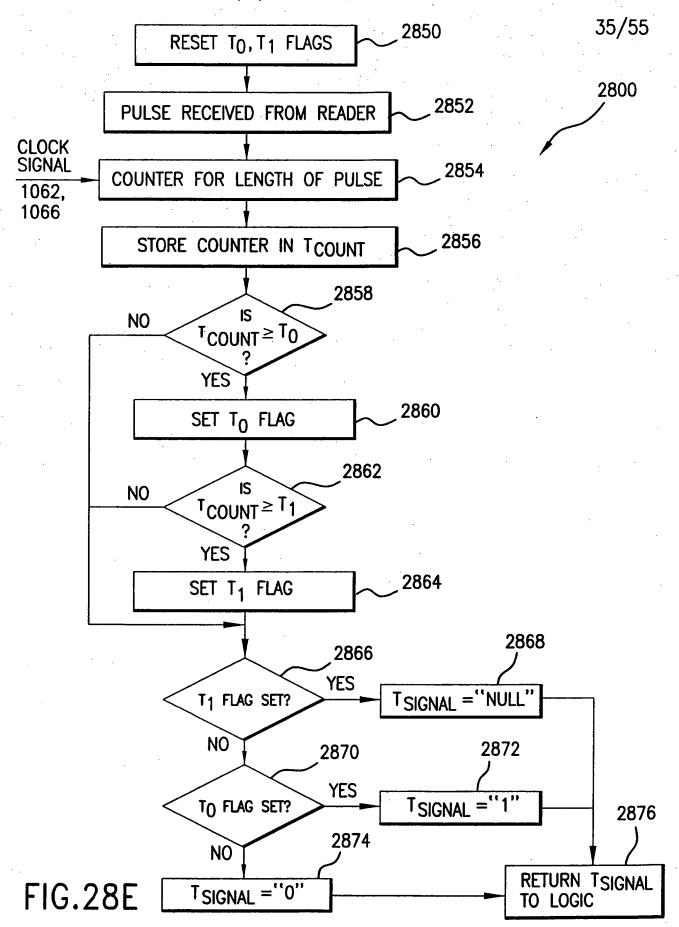


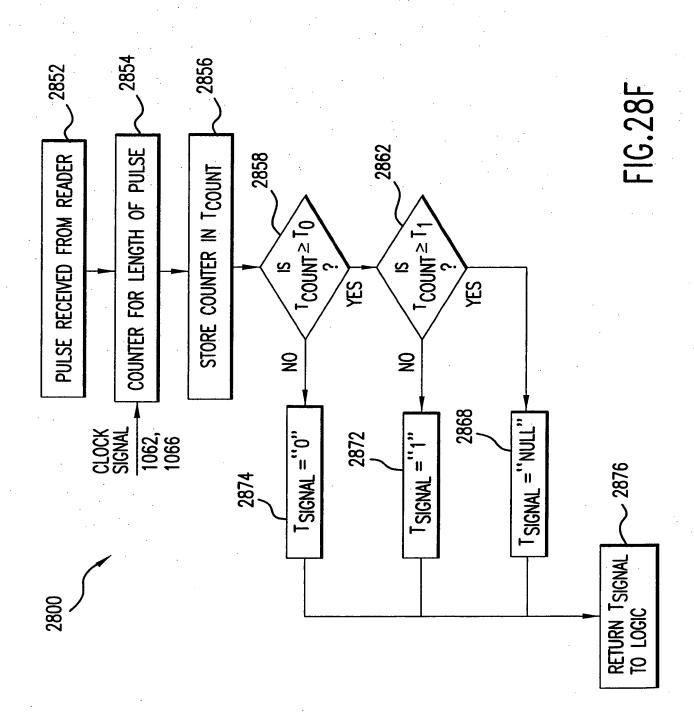
FIG.28D

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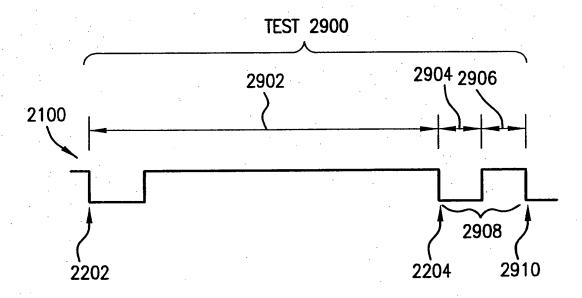


FIG.29

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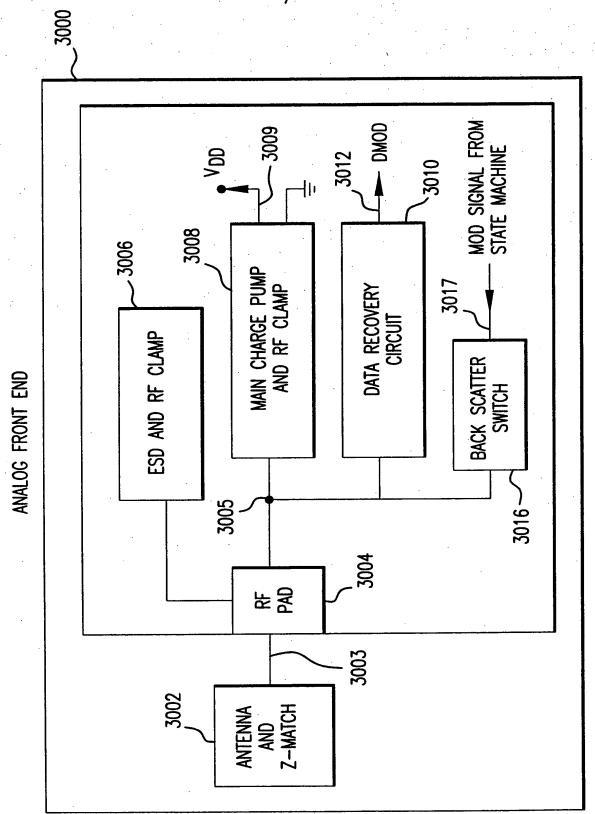


FIG.30

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Inventors: SHANKS et al.
Tel. No.: 202-371-2600
For: Radio Frequency Identification Architecture

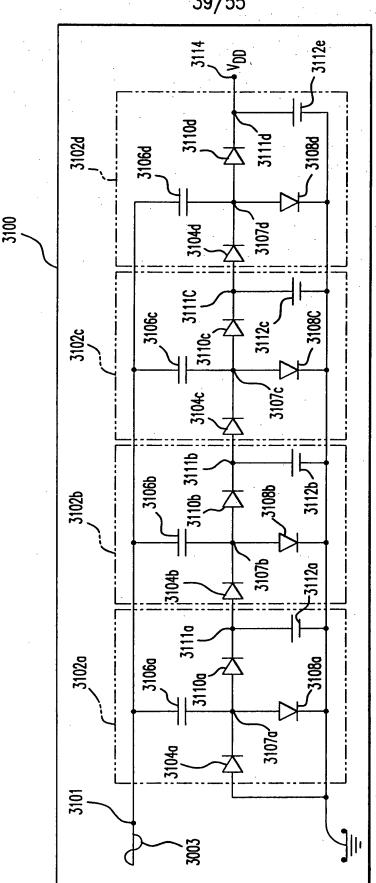


FIG.31

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Tel. No.: 202-371-2600
For: Radio Frequency Identification Architecture



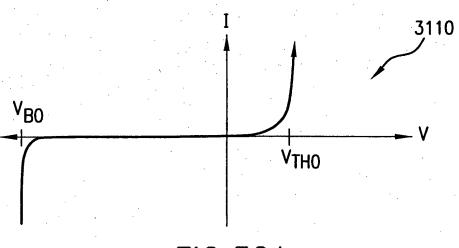


FIG.32A

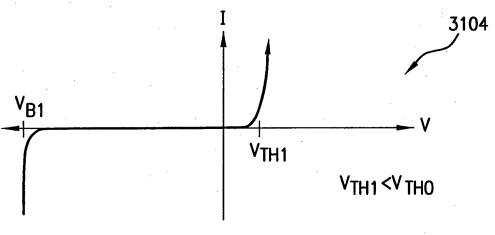


FIG.32B

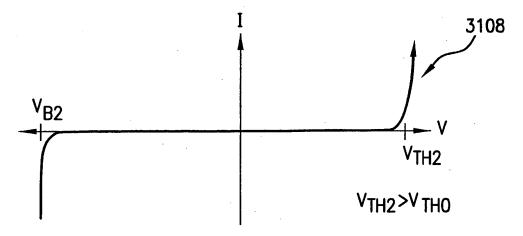


FIG.32C

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Inventors: SHANKS et al.
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For: Radio Frequency Identification Architecture

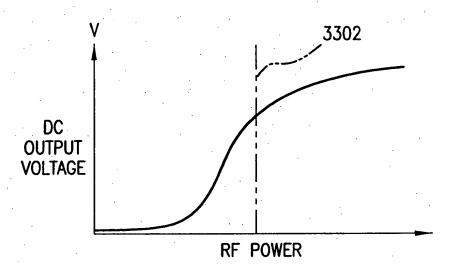


FIG.33A

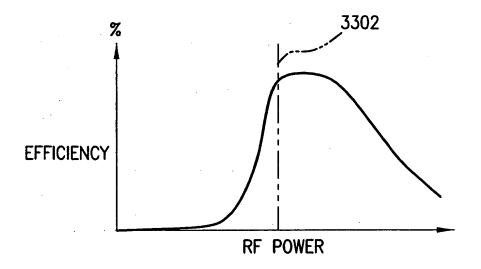


FIG.33B

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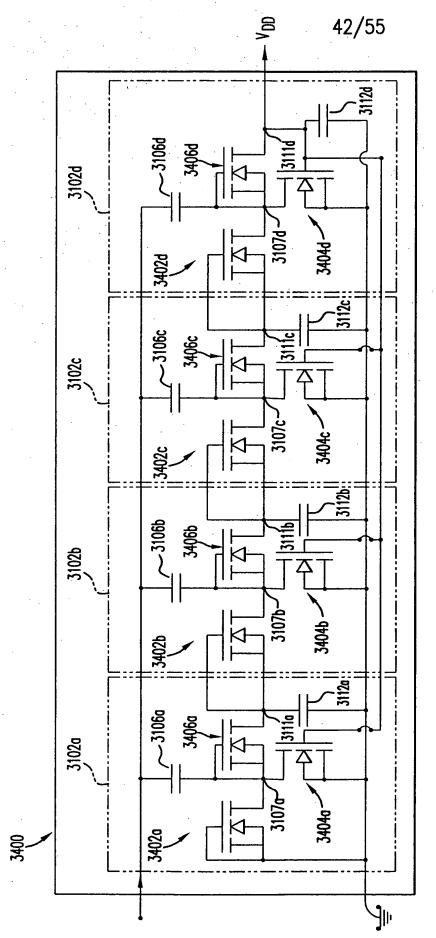


FIG.34A

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Inventors: SHANKS et al.
Tel. No.: 202-371-2600 For: Radio Frequency Identification Architecture 43/55 311fd 3102d 3102c 3102b 31120 3111a 3102a 3400 ]||

FIG.34B

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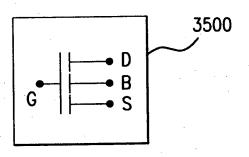


FIG.35A

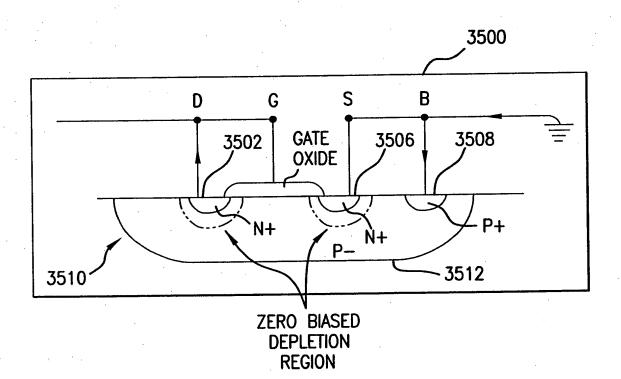


FIG.35B

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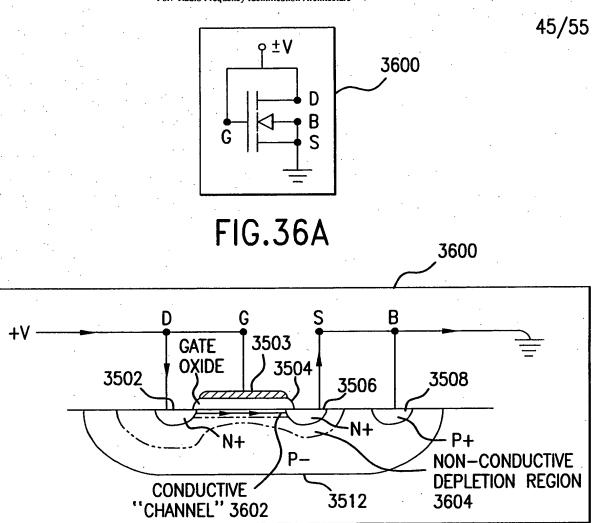


FIG.36B

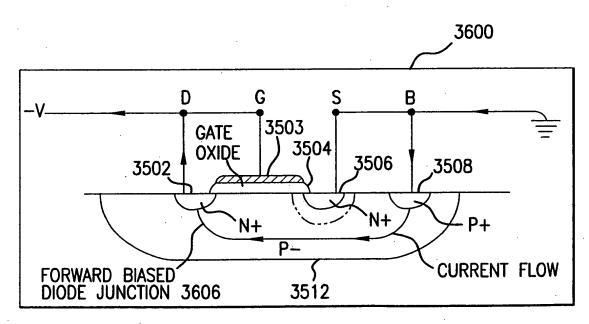


FIG.36C

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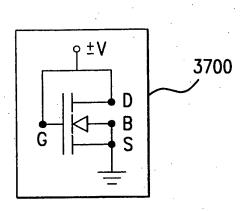


FIG.37A

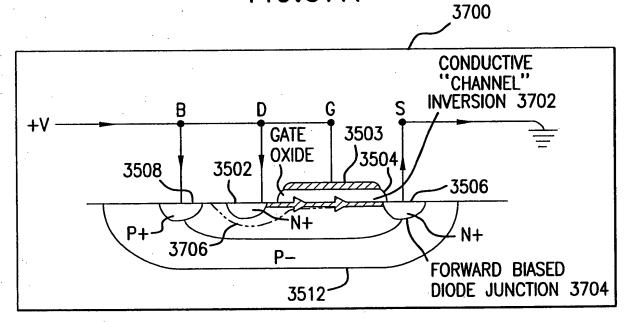


FIG.37B

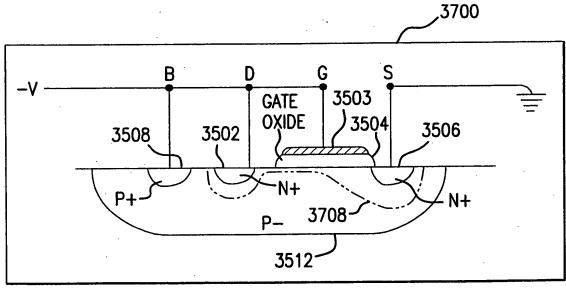


FIG.37C

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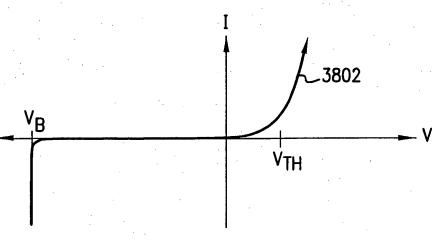


FIG.38A

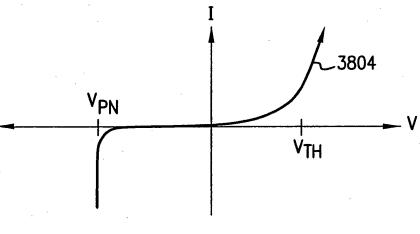


FIG.38B

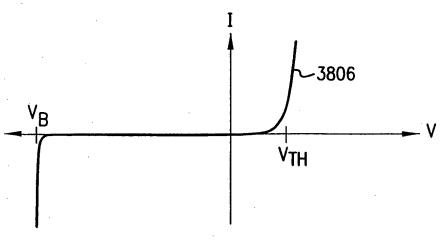


FIG.38C

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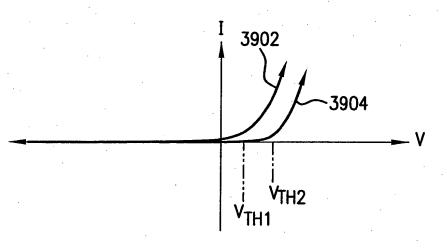


FIG.39

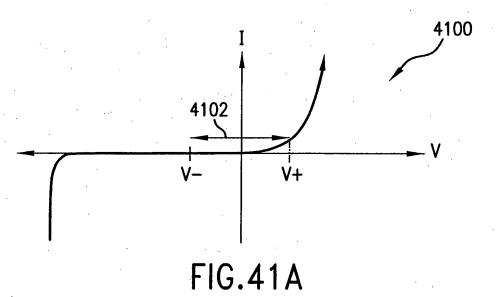
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Inventors: SHANKS et al.
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FIG.40B

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FIG.41B

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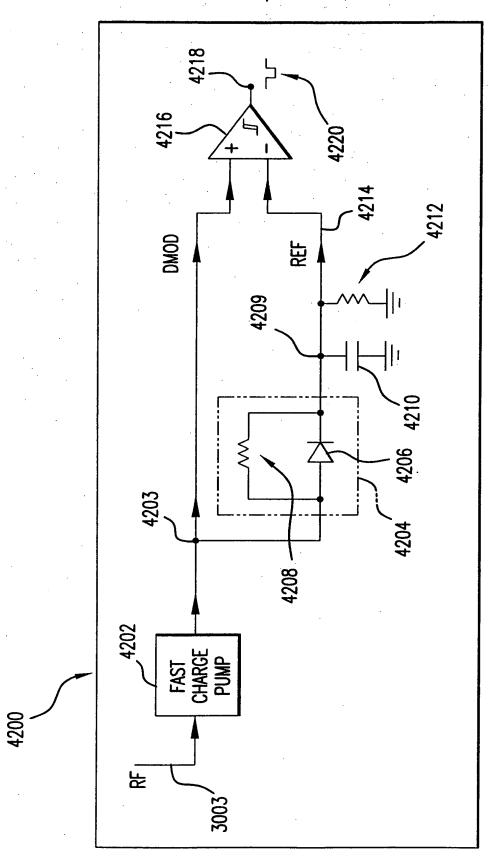


FIG.42

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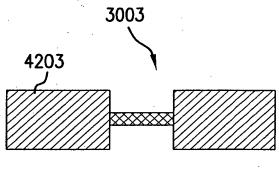


FIG.43A

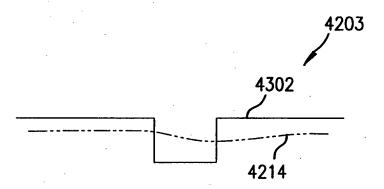
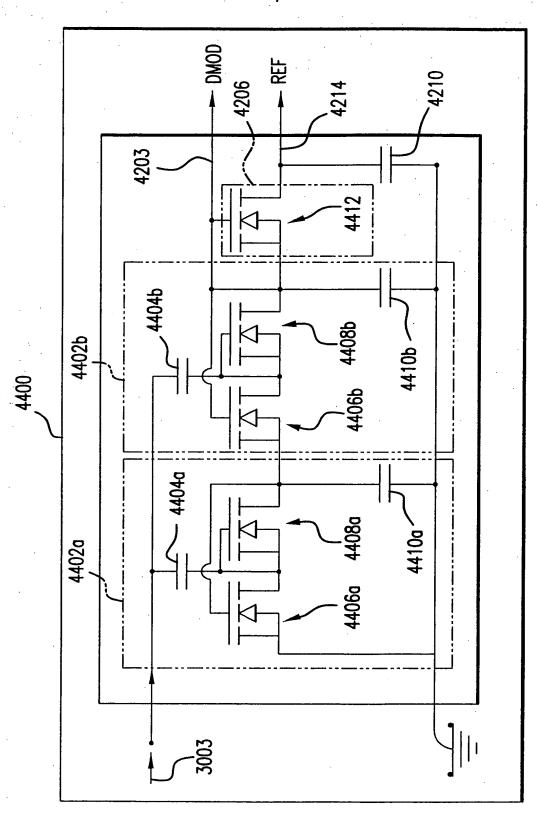


FIG.43B

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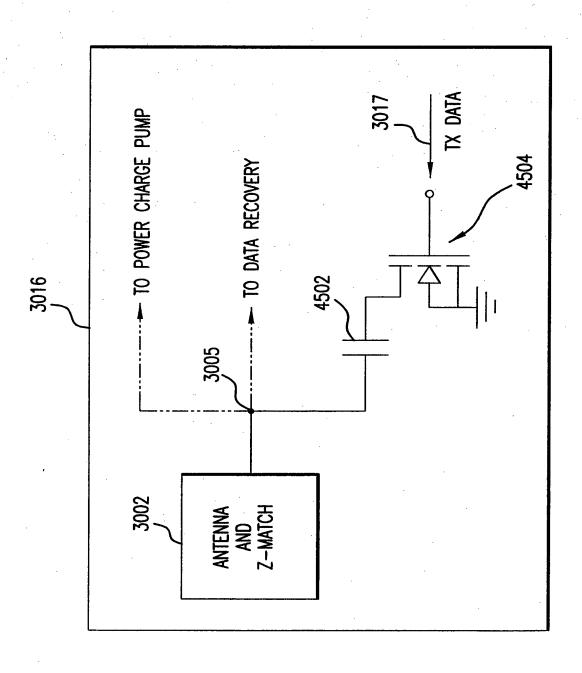


FIG.45